KAZAKHSTAN

AKTOBE WWTP MODERNISATION PROJECT

Non-Technical Summary

July 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

AD	Anaerobic Digestion
ASEG	JSC Aqtobe Su-Energy Group
CESMP	Contractor's Environmental and Social Management Plan
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, health and safety
EIA	Environmental Impact Assessment
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
EUR	Euros
E&S	Environmental and Social
FS	Feasibility Study
GHG	Green House Gas
H&S	Health and Safety
KZT	Kazakhstani Tenge
NTS	Non-Technical Summary
OHS	Occupational health and safety
PAI	Project Area of Influence (PAI)
PR	Performance Requirement of EBRD
SEE	State Environmental Expertise
URE	Treated effluent retention reservoir
WW	Wastewater
WWTP	Wastewater Treatment Plant

1 PROJECT DESCRIPTION

The European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) is considering providing finance to JSC Aqtobe Su-Energy Group (“ASEG” or the “Company”), a city-owned company providing water supply, wastewater management, and district heating services in Aktobe City. The finance will be used for construction of a new wastewater treatment plant (WWTP) (the “Project”).

This Non-Technical Summary (NTS) presents the results of the Environmental and Social Impact Assessment (ESIA) of the proposed Project. It also summarizes proposed mitigation and management measures to effectively mitigate the negative impacts of the Project and to enhance the positive impacts.

Aktobe City is located in the north-western part of Kazakhstan and is the administrative centre of the Aktobe Region.

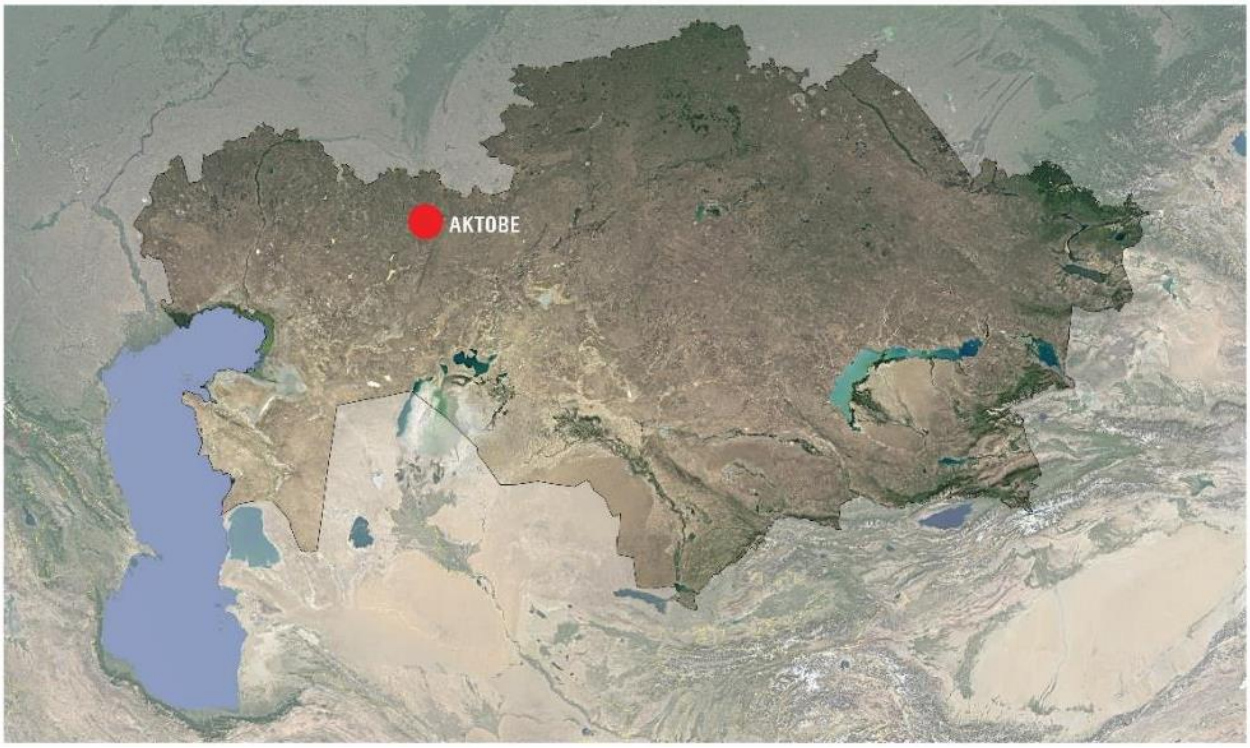

Figure 1.1: Location of Aktobe City in north-western Kazakhstan

A consultancy team from Sweco Danmark and the Kazakhstani company EcoSocio Analysis (the “Consultant”) was engaged by EBRD to conduct a scoping process to identify key environmental and social issues related to the proposed Project and subsequently to carry out the Environmental and Social Impact Assessment (ESIA) of the proposed Project.

A Feasibility Study (FS) conducted by the Kazakhstani company Aquarem was presented in April 2023, proposing the construction of a new WWTP on an approx. 11 ha plot of land adjacent to the east of the existing Aktobe WWTP. This will serve a population of nominally 500,000 and have an average influent wastewater capacity of 100,000 m^3/day, and a maximum daily capacity of 130,000 m^3/day. This project proposal forms the basis for the ESIA.

The Project comprises the following key infrastructure components:

- Construction of a new WWTP based on activated sludge technology and with design capacity of 100,000 m^3/day average flow and 130,000 m^3/day peak daily flow (500,000 P.E.) compliant with national and EU standards for urban wastewater treatment, including modernisation of a pumping station.
- Anaerobic Digestor (AD) line capacity to treat 195 tons/day of dewatered sludge (at 25% solids) via primary and secondary digestion resulting in on average 22,000 m^3 biogas/day.
- A combined heat and power (CHP) facility to produce heat and electricity from biogas generated by the AD facility, with estimated approx. 66,000 kWh/day thermal energy and 50,140 kWh/day electric energy. The power generated by the CHP will be used at the WWTP site.

The Project will be implemented in line with the national and EU standards for wastewater treatment, EU requirements for sewage sludge management, EU BAT and EU taxonomy requirements for such facilities. Once implemented, the project will also lead to a reduced level of odour.

Relocation of parts of the existing 110 kV (estimated 543 m and 7 towers), 35kV (estimated 1,150 m and 11 towers) and 6kV (estimated 540 m) overhead power lines that are located on the project site will also be required. The overhead lines are planned to be relocated along the perimeter of the new WWTP, This component will be financed from the municipal budget and is considered an 'associated facility' of the proposed Project.

Selected characteristics of the Project in terms of timing and scope are summarised in Table 1.1 below.

Table 1.1: Summary of key project characteristics

Key project characteristics	
Project proponent	Aktobe Su Energy Group (ASEG)
Estimated investment cost (CAPEX)	USD 175.7 million (KZT 78,559,378,638), *incl.* VAT. *Exchange rate as in May 2023: 447 KZT = 1 USD.*
Design capacity for wastewater (WW) treatment	500,000 PE, 100,000 m^3/day average and 130,000 m^3/day peak
Start and duration of construction phase	Planned construction start in June 2024. Duration of construction 36 months.
Estimated commission date of new WWTP	June 2027
Design lifetime of new WWTP	50 years (Civil works) 15 years (Mechanical works)
Number of staff during construction	100
Number of staff during operation	50

The Feasibility Study proposed:

- The use of modern energy-saving technologies and more advanced equipment for wastewater treatment.
- Implementation of the Project would significantly reduce the amount of wastewater pollution and improve the quality of wastewater suitable for irrigation.
- Improvement of the sanitary and epidemiological well-being of the city's population.

The purpose of the new Aktobe WWTP is:

1. To produce a treated effluent that is EU-compliant and meeting discharge standards for disposal to the receiving waters.
2. To produce a stabilized sludge suitable for reuse or final disposal.

Due to the sensitivity of the receiving waters (Ilek River) and the strict discharge standards for the WWTP, the treatment process is designed for biological nutrient removal, with EU-compliant treatment of the entire flow of wastewater. The new WWTP should have at least two separate parallel processing lines to facilitate maintenance.

2 BACKGROUND

2.1 Rationale of the Project

The city of Aktobe (the "City") has a population of *approx.* 525,000. The existing WWTP was constructed in the period 1982-1984 on a 70 ha site *approx*. 5 km to the north-west of the City, and is therefore over 40 years old. It underwent reconstruction from 2009-2011 including improvements to the sand traps and sedimentation tanks.

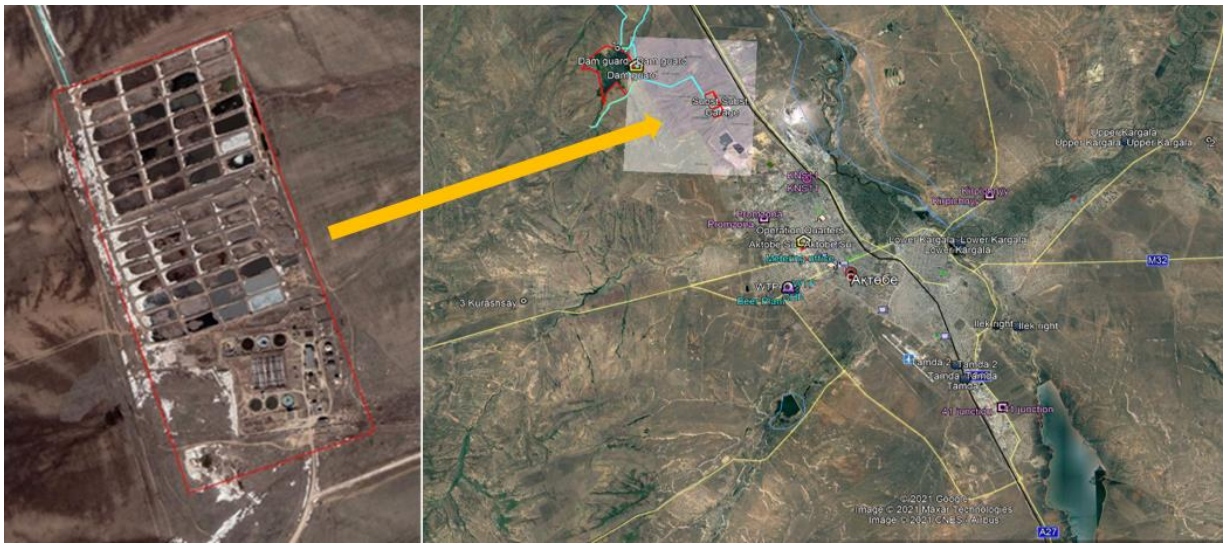

Figure 2.1: Location and visual of Aktobe WWTP

The WWTP collects wastewater (WW) from the city, where approx. 62% of the population is directly connected to the treatment plant via sewers. While the initial design capacity of the WWTP was 103,000 m^3/d, the actual average daily inflow to the plant is estimated to be about 55,000 m^3/day. The treated effluent is discharged via 2 x 5 km pipes into a retention reservoir, from which it is discharged into the Ilek River through a 9 km natural creek bed. The Ilek River is transboundary, flowing from Aktobe region into the Orenburg Oblast in Russia. It has a total length of 150 km and is a left tributary to the Ural River.

The distance from the effluent discharge point to the Ilek river to the Russian border is approx. 80 km. Due to the distance, dilution, and the likely multiple other anthropogenic impacts on the river over this distance, the Project is not seen as a source of transboundary impacts.

Recent studies have shown that the existing WWTP is in a poor state of repair due to a low operations and maintenance budget. Most of the WWTP equipment is outdated and in poor condition. The three working biological treatment basins are in a semi-emergency condition, as the prefabricated reinforced concrete structures of partitions and walls are deteriorated. Only two of the four secondary treatment lines are currently operating. The concrete structures are partially damaged, and the reinforcement is exposed.

The treated effluent is transferred to an effluent retention reservoir called the URE. However, there have been concerns regarding the safety of the dam holding the retention reservoir, as the reinforced concrete on the surface of the dam has been damaged. Therefore, the URE is not filled to its full design capacity.

The existing WWTP does not currently treat WW to meet the effluent standards or the maximum permitted concentrations in the URE, reflected in its Operation Permit. With EBRD involvement, it will also need to treat WW in line with international standards (EU Urban Wastewater Treatment Directive). It is therefore necessary to modernise wastewater treatment in Aktobe to meet both national and EU standards for effluent quality.

2.2 Current environmental and social situation and considerations

2.2.1 Project area

The spatial boundaries of the ESIA comprise the geographical area that is potentially affected by the Project, also referred to as the Project Area of Influence (PAI) and reflects the types and geographical scope of potential environmental and social risks and impacts. The key areas that may be directly affected by project activities, and thus falling within the scope of the ESIA, include:

1) The **WWTP site** (including relocation of overhead power lines) where direct physical impacts can occur (Project footprint) such as removal of vegetation and change in land-use.
2) **Areas used for sludge management and disposal**, including the existing sludge beds and the backfilled borrow pit next to the URE, which is used for long term disposal of dried sludge.
3) **Main roads to and from the WWTP site**, where heavy transport can be a source of impacts.
4) **Villages and other inhabited areas** in the vicinity of the WWTP site, where e.g., odour could be felt.
5) **Waterways** downstream from the WWTP, where treated effluents are discharged and impacts on water quality may be felt, including the **URE retention reservoir**, the 9 km **creek bed leading from the reservoir to the Ilek River**, and the **Ilek River itself** (considered approximately 500 m above and below the discharge point of the creek to the river). There is also a bypass channel which allows for bypassing the URE, if necessary. Management of the URE reservoir is the responsibility of ASEG. The URE discharge channel to the Ilek River and the Ilek River are only directly affected from around March 20th to May 5th when discharge is released from the URE.

The PAI informs the ESIA study area for the proposed project and consists of the above key features reflected in Figure 2.2 below.

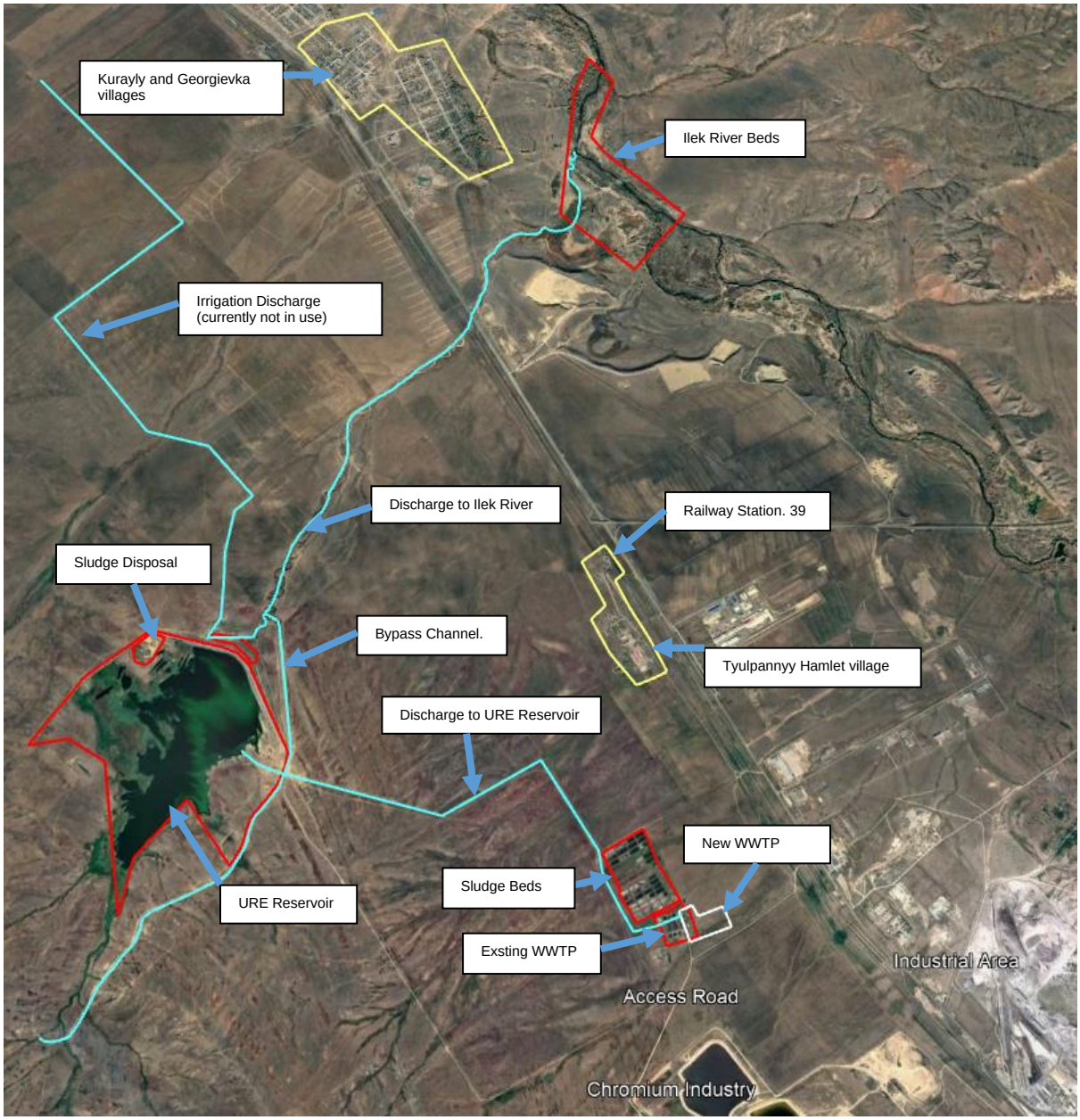

Figure 2.2: The ESIA study area of the proposed WWTP project, consisting primarily of the existing and new WWTP sites, sludge management sites, the discharge pipe from the WWTP to the URE retention reservoir, the URE retention reservoir and the open discharge channel from the reservoir to the Ilek river, the Ilek river 500 m above and below the discharge point, farms and villages in the vicinity of the Project (nearest villages at a distance of 2km from the existing WWTP marked with yellow lines). (Map source: Google Earth)

2.2.2 Environmental situation

The Environmental and Social Assessment has considered the aspects of the physical and natural environment that are likely to be affected by the proposed Project.

The proposed WWTP site is located on a relatively flat and remote area adjacent to the existing WWTP. Overall, Aktobe experiences harsh and cold winters and warm summers, with large variability between years. Although seasonal and annual variations make it difficult to conclude on climate change trends for

Aktobe, the available data indicates that the region is considered likely to experience increasing temperatures within all seasons, as well as increase in precipitation within all seasons, except for the summer season.

No significant surface water bodies are around the WWTP site and groundwater appears to be at a depth of at least 4 meters and in other locations >8m and not affecting the WWTP site.

The URE effluent retention reservoir is man-made with a dam and has been used to retain effluent water prior to discharge to the Ilek river and in the past for irrigating agriculture. The current quality of the water in the dam is poor, odorous, and reflecting the poor quality of effluents discharged to it from the WWTP. The Ilek River has a low water flow and hence has limited capacity to dilute large amounts of polluted water, and water from the URE is only discharged to it when the river water flow is at its highest. That said, the river is already a subject of various anthropogenic impacts in the form of both water extraction and discharge upstream and downstream. Yet, it is classified as 1st class according to the Unified system of classification of water quality in the water bodies. Continued use of the URE retention reservoir can be seen as an important prerequisite if the treated effluents from the proposed WWTP are to be used for irrigation.

The overall ambient air quality at the WWTP is considered relatively good, is open to winds and with capacity to accommodate some impacts.

The main source of impacts from the current WWTP is odour. This is a significant issue and an important source of nuisance and reduced wellbeing in inhabited areas closest to the WWTP, the URE, the discharge channel and the point of discharge to the Ilek river as these constitute different sources of odour.

The main vegetation area directly affected by the Project is the proposed new WWTP site adjacent to the current WWTP site and comprising of approximately 11 ha that will be transformed from greenfield to industrial use. The site is currently largely divided into a hay field, wasteland, and depression where thaw water remains for some time during springs. The area is characterised by low species diversity, and none are rare or protected species. The proposed WWTP site is not diverse in fauna and no mammals and reptiles, their tracks, borrows, excrements or food remains were noted during the fauna survey in May 2023. 42 bird species were observed during the survey, around the existing and proposed WWTP site, sludge ponds and URE reservoir, of which two are listed in the Kazakhstan Red Data Book, one near threatened and one of least concern, both in the sludge pond area. Two other species classified as of least concern were observed nesting nearby and using URE and sludge beds open water for the chicks rearing.

An aquatic invertebrate fauna study conducted in the Ilek river indicates that the poor-quality effluent discharge from the existing WWTP via the URE has negative impacts on the aquatic macrofauna species numbers and diversity in the river, closest to the discharge point. Species indicating polluted water were found closest to the discharge point to the river, whereas the upstream control sampling point showed the highest diversity and relatively high quantitative species indicators, and sampling points further downstream from the discharge point indicated gradual recovery (but not full) and improvement in species diversity.

2.2.3 Socio-economic situation

Aktobe City has a total area of 2,532 sq.km and a population of 523,665 (2022). The geographical area of Aktobe City was expanded within the last ten years to include five rural districts with several villages, thereby increasing the population in the city. In 2022, approx. 84% of the population in Aktobe City were of Kazakh origin, while most of the remaining population were of Russian origin.

The city’s total unemployment rate was 4.6% in 2022, with a higher rate for men (5.5%) than for women (3.6%). The youth unemployment rate was, however, significantly higher for women (4.6%) than for men

(2.2%). 3.3% of the population in Aktobe City and 4.25% of the population in Aktobe Region lived in 2022 below the official subsistence level, which defines the minimum level of income to buy food and goods.

In 2022, approx. 33,000 persons in Aktobe City were engaged in the construction sector, which constituted 10.3% of the total workforce, which is slightly higher than the percentage of the workforce in Aktobe Region (8.5%) and at national level (7.3%). Industry (mining and manufacturing) was the economic sector in Aktobe City and Aktobe Region that employed the highest percentage of the workforce (21.2% and 20.1%, respectively), which is significantly higher than the percentage engaged in this sector at national level (12.5%).

The social setting of the Project in terms of community-level stakeholders and their distances to WWTP operations is set out in the table below.

Table 2.1: Community-level stakeholders in the ESIA study area

Community-level stakeholders	**Population**	**Distance to WWTP**
Residents in the settlements of Railway Junction 39 and Tulpannyy hamlet	158	2 km north of the WWTP
Residents in Georgievka village	1,828	10 km north of the WWTP
Residents in Kurayly village	1,859	10-11 km north of the WWTP
Temir Tulpar Batys LLP farm		Fields are 0-9 km from the WWTP
Aterra LLP farm		Fields are 0-27 km from the WWTP
Nan farm		Fields are 0-39 km from the WWTP
ANDI LLP farm		Fields are 2-10 km from the WWTP
JSC Aktobe Chromium Compounds Plant		Located 1 km south of the new WWTP area
Residents in Aktobe City		Other residents in Aktobe City than those mentioned above are located relatively far away from the WWTP.

In addition to the chromium plant mentioned in the table above, there are several other industries located in a radius of 3-6 km from the existing and the proposed new WWTP. These include a large ferroalloys plant and manufacturers of polyethylene products, oil production equipment, reinforced concrete, and railway components.

There are no registered historical and cultural heritage sites at or close to the proposed site of the new WWTP.

The new WWTP is planned to be constructed on a 10.8 ha land plot which is state-owned land. The Aktobe City Akimat issued Resolution No. 235 on 14 March 2023 to grant the Department of Housing and Communal Services, Passenger Transport and Highways of Aktobe City the right to use a land plot of 10.8 ha for a period of five years for the construction of a WWTP in Aktobe City. 2.1 ha of the land plot is currently under lease of the owner of the farm Temir Tulpar Batys LLC who has the user right of this land. This is also the case of the 1 ha of land that will be acquired for the relocation of the overhead power lines. ASEG in cooperation with the Aktobe City Land Management Department has consulted the farmer and the three parties have agreed in writing on a change of the boundaries of plot 02-036-164-435 withdrawing a total of 3.1 ha from the lease agreement and providing replacement land of same quality to the farmer.

2.3 Project development and planning

A range of Project alternatives were considered in the process leading up the proposed WWTP design. These are summarized in the table below.

Table 2.2: Project alternatives considered

Aspect	Option	Outcome/ Chosen option
Renovate parts of the existing WWTP vs. build an entirely new WWTP	1. Rehabilitation of the existing WWTP and expansion with a new parallel treatment line 2. Brand new WWTP to service the whole population of Aktobe	Brand new WWTP to service the whole population of Aktobe.
Wastewater treatment technology	1. A2O process (Anaerobic-Anoxic-Oxic) 2. Johannesburg process 3. Modified UCT process	Modified UCT process selected.
Sludge treatment technology	1. Anaerobic sludge digestion with production of biogas for combustion in a Combined Heat and Power plant for production of electricity. 2. Sludge dewatering, drying and combustion, however no biogas production for electricity generation.	Anaerobic digestion of the sludge with biogas production and combustion.
Use of generated sludge	1. Sludge re-use for agricultural purposes 2. Sludge storage on-site (at the WWTP site) or at a long-term storage facility with opportunity for re-using some of the sludge for horticulture or land rehabilitation uses. 3. Long-term disposal at landfill.	Utilising the digested sludge from the WWTP as fertiliser. An area has been proposed for short term storage of sludge within the WWTP site, prior to collection for land application. However, a detailed plan for sludge reuse and alternatively disposal needs to be developed.
Use of existing sludge beds	1. Decommission ponds and rehabilitate the land for other use. 2. Decommission ponds and rehabilitate the land for other use. 3. Maintain some sludge ponds for emergency use	Use of the existing sludge ponds as a standby in emergency situations. Rehabilitation or other works on the sludge beds are not foreseen or planned at present, but a sludge bed decommissioning plan will be a requirement of the new WWTP project.
Decommissioning of the existing WWTP	1. Retain the existing works for emergency situations. 2. Demolition of existing works	Demolition of three decommissioned digester tanks of 1600m^3. It is not envisaged to demolish other structures and buildings within the existing WWTP site within the scope of the proposed Project.

3 PROCESS

3.1 National environmental approval process for new WWTP

In accordance with national law, an EIA must be carried out for the proposed WWTP by a company licensed to perform such assessments in Kazakhstan[1]. An EIA is mandatory for a WWTP with a capacity of 30,000 m^3 per day or more, which applies to the Aktobe Project. The correlation between project design stages and corresponding EIA stages is summarized in Table 3.1.

[1] The national Law on Permissions and Notifications No. 202-V, dd 16 May 2014

In parallel with the feasibility study (FS), Aquarem has thus worked on a Preliminary Environmental Impact Assessment (EIA) which has been submitted to the State Environmental Expertise (SEE) and is currently being publicly disclosed[2]. The FS with preliminary design by Aquarem has been approved by ASEG and delivered to the SEE for review.

To progress to the next stage of the project design, the Preliminary EIA has to be approved by the SEE. If the positive SEE conclusion on the Preliminary EIA does not recommend further environmental work, such approval is considered final. However, if the results of a Preliminary EIA or analogies show that impacts from the projected development are likely to be considerable or uncertain, then the SEE recommends performing a full EIA.

No official project approval has been obtained from the SEE by 1 July 2023. This is expected in about a month from delivering the EIA, if approved by SEE.

Table 3.1: Correlation between the environmental and engineering stages during design

EIA stage	Engineering stage
Preliminary EIA	Feasibility Study (pre-design documentation)
Full national EIA	Technical/detailed design documentation

At the EIA stage, construction pollution is calculated using the proposed personnel, machinery, and material specifications. Composition of EIA reports can differ between large complex and small benign developments. For the Aktobe WWTP Project, all maximum permitted pollution calculations are to be presented in the SEE approved EIA. These calculations are required to obtain an Emissions Permit. The positive conclusion on an EIA by SEE acts as a permit for the calculated pollution. A sanitary protection zone will be established according to the Sanitary-Epidemiological requirements based on calculation of emissions, discharges, and waste volumes.

The authorities must be informed about any changes in the project approved by the SEE that may affect the environment. The project will not require a second review, as long as re-calculated volumes of the used resources, pollution and waste disposal do not exceed the earlier permitted amounts and the level of negative impacts do not increase.

3.2 International ESIA Process

The ESIA should follow a report format consistent with the EU EIA Directive, and should address the concerns of all EBRD's Performance Requirements (PRs), e.g., projects involving involuntary resettlement (PR5), risks to biodiversity (PR6), impacts on cultural heritage (PR8) will require an assessment in accordance with the respective PR. The ESIA shall include an analysis of reasonable alternatives, in terms of project location, technology, size, scale and design.

Category A projects, like the WWTP Project in Aktobe, require EBRD's Client – in this case ASEG – to carry out a formalised, participatory disclosure and consultation process which will be built into each stage of the ESIA process. This process involves organised and iterative consultation leading to the consideration of views of key stakeholders, including communities affected by the project.

The Client is to engage in a scoping process with identified stakeholders at an early stage of the ESIA process to ensure identification of key risks and impacts to be assessed as part of the ESIA. The Client will publicly disclose draft documents from the ESIA process, enabling everyone to provide comments on the draft documents. The public disclosure period is 120 calendar days.

[2] - ЕЭП (ecoportal.kz)

4 SUMMARY OF ENVIRONMENTAL AND SOCIAL BENEFITS, POTENTIAL ADVERSE IMPACTS, MITIGATION AND MANAGEMENT MEASURES

The ESIA has assessed the potential environmental and social (E&S) impacts of the proposed Project to construct a new EU-compliant WWTP to replace the existing WWTP in Aktobe City. The location of the site of the new WWTP, which is immediately adjacent to the existing WWTP, is considered appropriate as it allows for continued use of key inflow and outflow piping infrastructure. Furthermore, the new WWTP will be located two km from the nearest residential area.

The overall impacts of the proposed WWTP Project are assessed to be positive. There are no significant negative impacts expected after successful implementation of proposed mitigation measures included in the Environmental and Social Management Plan (ESMP) for the Project. This applies to both environmental and socio-economic aspects.

4.1 Environmental Aspects

4.1.1 Benefits

The existing WWTP effluents are of very poor quality and raw sludge is dried and treated in sludge ponds without prior stabilization. Both the sludge handling and effluents from the existing WWTP result in substantial odour problems. In particular, the poor effluent quality carries foul odours several kilometres downstream, negatively effecting wellbeing in nearby communities. It also has negative impacts on downstream water quality and aquatic habitats in the URE retention reservoir and the Ilek river.

Hence, the most significant impact of the Project will be improvements in effluent quality to EU and national standards, and the sludge treatment will be much improved with the introduction of anaerobic digestion (AD) to the WW treatment process. Both aspects are expected to significantly reduce or eliminate current odour problems. The improved WWTP sludge handling will also substantially reduce the Green House Gas (GHG) emissions associated with WW treatment, compared to the current situation.

The outcome of the proposed Project will create an opportunity to reuse both the effluents and sludge for agricultural purposes. However, a detailed plan for how to promote effluent reuse and to ensure offtake of the treated sludge has not yet been presented, nor has a plan for closure of the existing sludge ponds. Hence, a plan for this needs to be prepared by ASEG in parallel with the detailed design of the WWTP, including a plan for alternative long-term storage of treated sludge in case there is not sufficient offtake capacity or interest by farmers in the area.

The effluents from the existing WWTP are continuously discharged to the man-made URE retention reservoir and then released to the Ilek river during spring each year. This arrangement is planned to continue for the treated effluents from the proposed new WWTP. There have been concerns about the integrity of the URE dam wall if the reservoir is filled to its full capacity of 40 million m^3, as water percolates into the dam wall with elevated risk of dam failure. Hence, the URE reservoir is only used to a capacity of 25 million m^3. The URE is seen as less critical to meet water quality standards in the Ilek river with the improved quality of treated effluent from the proposed WWTP. However, it is considered likely that the importance of the URE may grow in case effluents will be used for irrigation, which is recommended to make full use of the water resource. Hence, to ensure safety of the URE dam for continued use by the proposed WWTP, it is required that an independent third-party dam integrity and safety assessment of the URE retention reservoir is performed, prior to its continued use for the new WWTP. This should be conducted by an independent qualified firm with the necessary experience and ensure that the dam structures of the reservoir are safe, fit and future-proof for receiving effluents from

the WWTP. This requirement is included in the project Environmental and Social Management Plan (ESMP).

4.1.2 Adverse impacts

Potential negative environmental impacts of the project are mostly typical for construction activities and operation of WWTP of similar size and complexity. These include risks of contamination of soil, surface and groundwater through daily construction and operation activities, air quality and noise. Given the relatively low sensitivity of the affected receptors, and substantial distance to residential areas, such impacts are considered of minor to moderate significance if not adequately managed, but they can be effectively mitigated through the implementation of proposed standard measures.

Effective mitigation requires implementation of a robust Environmental and Social (E&S) management system in line with international good practice management system standards. This will bring the negative environmental impacts of the Project to be minor or negligible.

Additionally, construction and operation of the Project is associated with risks for worker health and safety, which are typical to construction and WWTP treatment activities. For this, ASEG and the involved contractors must adopt strict H&S management procedures. Hence, a prerequisite for successful Project implementation is that Environmental & Social (incl. Health and Safety) management is fully adopted, led, and supervised by ASEG, and integrated in all works conducted by contractors involved in the Project. To enable this, training, and capacity building in E&S management amongst ASEG staff and its partners needs to be organised throughout the Project lifecycle.

4.1.3 Mitigation and Management Measures

In addition to general management system measures, impact specific mitigation measures have been proposed in the ESMP to address the adverse environmental impacts related to the Project's key phases:

- Preconstruction phase and Construction phase
- Operation phase

Pre-construction and Construction Phase

Pre-construction activities relate to further detailed planning and design of the Project and is the responsibility of ASEG in collaboration with its design contractors and consultants. E&S management during construction requires oversight and monitoring from ASEG, while its organisation and daily implementation is the responsibility of the contractors.

The following present key mitigation measures of the ESMP:

- Assess integrity and safety of the URE dam and initiate improvements as needed.
- Develop a plan for closing and rehabilitating disturbed construction areas, and for decommissioning and rehabilitating the part of the existing sludge pond area that is not required for emergency purposes.
- Integrate infrastructure H&S measures, including noise reduction into final design of the WWTP.
- Integrate advance biogas leakage monitoring and control technology into the design of anaerobic digestion plant.
- Design effective site drainage and storm water management infrastructure at the site, including soil erosion mitigation. Include climate resilience considerations in the final design.
- Incorporate energy-efficient design principles into the treatment plant layout and infrastructure.
- Implement controlled excavation practices to minimise soil and vegetation disturbance.
- Design and implement a demolition plan for existing WWTP site, including measures to dispose of demolition waste.

- Implement spill prevention and control measures.
- Choose equipment and machinery with low noise emission levels.
- Develop and implement an emergency response plan for the WWTP construction.

As a general measure, a site-specific/detailed Contractor's Environmental and Social Management Plan (CESMP) needs to be developed based on the Client's ESMP developed for this Project, prior to starting construction. Construction mitigation measures are mainly to be implemented by the selected contractor(s).

Operation Phase

Implementing mitigation measures related to the operation phase will mainly be the responsibility of ASEG. As explained in further details in section 4.4, ASEG is to have in place an Environmental and Social Management System (ESMS), based on ISO14001 (Environmental Management) and ISO45001 (Occupational Health and Safety management). This provides the framework for integrating environmental and social considerations into ASEG's WWTP operations. The following present specific key mitigation measures of the developed ESMP:

- Develop a resource management and conservation plan, that amongst other includes a plan for reusing effluents and sludge from the WWTP, including measures to consult relevant farmers and other stakeholders with regards to utilisation of these resources and to determine alternative sludge disposal options if sludge reuse is not possible.
- Maintain an effective site drainage and storm water management infrastructure at the site.
- Monitoring of sludge and effluent quality.
- Monitoring of air quality and odours at the site boundary and within sanitary protection zone.
- Create or enhance biodiversity habitats nearby to compensate for any lost or impacted habitats, e.g., through rehabilitation of the existing sludge pond area. A dedicated biodiversity management plan is not required, but biodiversity considerations should be given due attention in the construction stage environmental management to avoid fauna disturbance, as well as in rehabilitation of the sludge pond area.
- Select native plant species appropriate for the site conditions and recreate habitats that support local biodiversity.
- Develop and implement an emergency response plan for the WWTP construction and operations, including climate resilience considerations.

4.2 Socio Economic Aspects

4.2.1 Benefits

The Project will through improvement of the wastewater treatment have a positive effect on the prevalence of water and sanitation related diseases in the Project area. This will, together with the significant reduction in odour which is mentioned by communities as a significant annoyance, substantially improve the health and wellbeing of the population in the Project area.

The construction of the WWTP will require around 100 workers during the 36-month construction phase which will create temporary employment opportunities for the population in the nearby villages and in Aktobe Region in general. As construction workers are expected to be hired locally there will be no significant influx of workers.

4.2.2 Adverse Impacts

The Project will have few negative socio-economic impacts. Due to the WWTP site's location in an industrial area with no communities in the proximity, the Project impacts on community health and safety due to construction influence on air quality and noise are of moderate significance and will with adequate mitigation and management be reduced to minor significance. Increased traffic and transport are moderate during construction if not adequately managed, but they can be effectively mitigated through the implementation of proposed measures. The risk of communicable diseases and the risk of gender-based violence and harassment are assessed to be minor after mitigation as influx of construction workers is not foreseen.

While some employment opportunities will be created during construction, there will be a reduction of WWTP staff in the operation phase, as the current WWTP staffing is considered excessive for the operation of the new WWTP. Efforts will be made to avoid collective dismissals by redistributing staff to other workplaces within the company. In case this is not possible, the process will be carried out in line with national and EBRD requirements.

The Project may lead to increased wastewater tariffs which could have negative impacts for vulnerable groups in Aktobe City. This needs to be monitored during operations to ensure that such impacts are adequately mitigated and managed by ASEG.
Other social aspects such as impacts on land use and cultural heritage are considered negligible after the implementation of proposed mitigation measures.

4.2.3 Mitigation and Management Measures

Impact specific mitigation measures been proposed in the ESMP to address adverse socio-economic impacts related to the Project's key phases:

- Preconstruction phase and Construction phase
- Operation phase

Pre-construction and Construction phase

As mentioned earlier, E&S management during construction requires oversight and monitoring from ASEG, while its organisation and daily implementation is the responsibility of the contractors. A site-specific/detailed Contractor ESMP is to be developed based on the Project ESMP.

The following present key mitigation measures of the ESMP:

- ASEG to ensure that the land acquisition be implemented in accordance with the written agreement dated July 2, 2023, between ASEG, the Aktobe Land Management Department and the farmer, withdrawing 3.1 ha of land under the farmer's lease agreement.
- The Contractor to adopt and implement a local recruitment policy and a Labour Management Plan including human resources policy and procedures, which will set out the approach to labour management consistent with the EBRD requirements and the laws of Kazakhstan.
- The Contractor to provide construction workers with access to an effective grievance mechanism.
- The Contractor to have in place a workers Code of Conduct including zero tolerance for gender-based violence and harassment (GBVH) and provide inductions and trainings for Contractor's and sub-contractors' staff to include awareness on GBVH definitions, prevention, encouragement to report/submit concerns and grievances related to GBVH etc.
- The Contractor to disseminate Project relevant information among local communities and provide access to a functioning grievance mechanism.
- The Contractor to develop and adopt a Chance Find Procedure for cultural heritage for the construction work.

- ASEG to develop and adapt an Occupational Health and Safety Policy and procedures for the construction Project, within their overall OHS management system. The policy and procedures are to be further developed and adopted by the contractor and sub-contractors.
- ASEG to commission a third-party dam integrity and safety assessment of the URE retention reservoir, prior to its continued use for the new WWTP.

Operation phase

Implementing mitigation measures related to the operation phase will mainly be the responsibility of ASEG. The following present key mitigation measures of the developed ESMP:

- Adopt and implement an OHS management system based on ISO 45001 for occupational health and safety management of ASEG's WWTP operations.
- Include the new WWTP traffic and transportation into ASEG's management plan.
- Develop and implement a Retrenchment Plan, including a staff reduction strategy at different stages of Project implementation.
- Monitor closely the affordability for low-income households after potential tariff increases due to the Project.

4.3 Cumulative impacts

The ESIA study has considered the potential cumulative impacts in relation to other existing, planned and/or proposed projects within the PAI. With regards to existing activities, the following cumulative impacts may be of relevance:

- **Noise** and **traffic safety** due to increase in heavy traffic during the construction phase of the WWTP which will be in addition to existing traffic load in the city. The main access to the proposed Project site is outside the city and passes through an existing industrial area, hence significant cumulative impacts affecting traffic levels or safety in the city are not anticipated.
- **Water quality in the Ilek river**; the Ilek river is already affected by various anthropogenic activities other than the Aktobe WWTP, both upstream and downstream from the effluent discharge point from the existing WWTP. Existing impacts can be expected to be reflected in the background water quality and benthic fauna characteristics upstream from the WWTP discharge point, as reflected in the respective baseline data.
- **Odour** from the WWTP activities; The existing WWTP is likely the most significant source of odour impacts in the area (based on, among others, focus group discussions). However, it is possible that other activities, e.g., nearby farms, may be sources of odour during periods, for example in relation to application of manure on fields. Such sources of odour impacts may not be felt currently due to the existing WWTP impacts.

Based on the information available during the ESIA process, no planned or proposed activities have been identified that could result in significant cumulative impacts in the context of the proposed WWTP Project.

4.4 Monitoring

ASEG needs to have in place an integrated Environmental and Social Management System (ESMS), based on ISO14001 (Environmental Management) and ISO45001 (Occupational Health and Safety management). The ESMS has the overall purpose to ensure appropriate management of E&S matters at the corporate level, and for the Project throughout the whole project lifecycle, including successful implementation of the ESMP and mitigation measures identified through the ESIA process.

An ESMS is a systemic approach for organisations to identify, manage, and mitigate the environmental and social risks and impacts associated with their activities, products, and services. It is designed to promote sustainable practices, ensure compliance with applicable regulations and standards, and engage

with stakeholders in a responsible and transparent manner. An ESMS typically comprises a range of policies, procedures, and practices that enable an organization to effectively address its environmental and social responsibilities. It provides a framework for integrating environmental and social considerations into the organization's decision-making processes and day-to-day operations.

4.4.1 Monitoring ESMP Implementation

The ASEG ESMS should include procedures to internally control the effectiveness of the ESMS components and the implementation and completion of the Project ESMP and its proposed mitigation measures. Activities should be reflected as internal audit and control procedures within the overall ESMS, with the aim to check that the ESMS and the ESMP are being implemented.

In terms of the responsibilities of contractors to implement the ESMP, ASEG shall have in place procedures within its overall ESMS to verify construction contractors' ESMS procedures and ESMP compliance. This verification can be through control audits of contractors' E&S management systems and performance, and through regular and frequent reporting by contractors to ASEG on E&S incidents and other key performance indicators related to the ESMP.

As an example, the monitoring of contractors' performance shall include (but not be limited to) contractors and subcontractors' compliance with OHS performance as per requirements in contracts, and compliance with the labour requirements as a special clause in the service and supply contracts. ASEG will also monitor contractors and subcontractors for compliance with requirements through regular labour and OHS inspections establishing compliance on the above.

4.4.2 Operational Environmental Monitoring

The operational Environmental Monitoring plan summarises the proposed environmental monitoring measures stemming from the ESIA. It reflects recommended monitoring activities which are required to monitor the effectiveness of proposed mitigation measures, and to verify the expected positive or negative impacts of the WWTP Project on key receptors during operation. This monitoring is the responsibility of ASEG, but can be outsourced to specialised service providers, as relevant. The following environmental aspects need to be monitored during the operation phase and are reflected in the proposed monitoring plan:

- Soil quality
- Climate and climate change aspects - GHG emissions
- Quality of effluents and digested sludge
- Water quality in the receiving waters, incl. URE reservoir and in the Ilek river
- Ambient air quality - Odour monitoring
- Noise, in particular with regards to impacts on workers' health and safety
- Invertebrate fauna in the Ilek River
- Use of effluents for irrigation and compliance with effluent reuse standards
- Use of treated sludge for land application and compliance with sludge reuse standards

Furthermore, ASEG should closely monitor the affordability for low-income household after potential tariff increases due to the Project. Continuous stakeholder engagement will be important in ensuring timely information on affordability issues concerning vulnerable households. Furthermore, the monitoring should include indicators such as i) outstanding payments among low-income households, and ii) customer grievances related to payment of tariffs, drawing on data from the ASEG customer department.

5 CONTACT DETAILS

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